

## India

### I. Current National Security Situation<sup>1</sup>

Since independence in 1947, India's economy and population have been growing steadily. Now a country with over one billion people, India's first priority is socio-economic development. At the same time, India believes that an assured level of regional stability is necessary for this development. To this end, India has traditionally pursued a broad policy of defensive defense. However military developments, and growing hostilities with Pakistan, have caused her to shift to a strategy of war prevention.<sup>2</sup>

Since India's growth is involving her more and more with economic, technological, and political developments in Asia and the rest of the world, she is also squarely confronted by the consequences of strategic change in the international security order. Developments shaping India's national security environment are occurring globally, in adjacent regions, within the Indian sub-continent, and domestically. Key developments include nuclear proliferation, the growing ascendancy of economic power as a key factor in international relations, India's relationships with the United States and Russia, turbulence in Central Asia and Afghanistan, global terrorism, and continuing enmity with China and Pakistan.<sup>3</sup>

#### *Specific Security Problems*

India is also undergoing strategic transformation from a Third World non-aligned state to one in which she must stand on her own two feet in the international community in the midst of a range of complex security issues. India faces major national security challenges from a resurgent China and the unstable Islamic state of Pakistan. Combined with continuing political instability in Central Asia to the north and the fear of regional Islamization, India's land borders face both active and potentially hostile opponents, at least two equipped with nuclear weapons. From the seas to the east, west and south, it is anticipated that Chinese nuclear-armed submarines may patrol at will in the future, within striking distance of the Indian land mass. It is expected that conventionally-powered Pakistani nuclear submarines will also ply these waters, and be equipped with nuclear-tipped cruise missiles. US naval forces, although considered less a threat than China and Pakistan, also patrol these waters, both on the surface and in its depths.

Internally, India faces an increasingly restless Muslim population, especially in the western regions and Kashmir, combined with persistent and age-old ethnic and racial strife among clans, castes and ethnic groupings. Several insurgencies are being supported by outside powers, namely Pakistan and China. The vast territory of the subcontinent, combined with the wide disparities in the natural conditions of potential combat zones present great challenges to the Indian Armed Forces, requiring, for example, jungle troops in one theater and high altitude alpine forces in others.

India is also concerned with the increased threat of ballistic missile attack from China, the Central Asian states, Afghanistan, Pakistan, Saudi Arabia, and Iran. This has led India

to defense through deterrence, and the concomitant development of the Prithvi and Agni missiles.<sup>4</sup>

### *National Security Policy*

India's national security policy objectives to meet these challenges were summarized by the Indian Prime Minister in 1995. These are: the defense of national territory over land, sea, and air to include the inviolability of land borders, land territories, offshore assets, and maritime trade routes; internal security against threats to unity or progress from religious, language, ethnic, or socio-economic dissonance, the ability to influence other regional countries to promote harmonious relationships that support Indian national interests; and the ability to execute out-of-area operations to contribute to international stability.<sup>5</sup>

India is not well prepared internally to meet these. In addition to the condition of India's Armed Forces, whose combat systems are facing block obsolescence, she does not have established mechanisms for national security decision making and planning, for insuring sustained professional attention to security problems, and for coordinating the requirements and combat actions of India's three military Services.<sup>6</sup> In spite of five wars in the 50 years of her existence, and the fact that India's armed forces have participated in 32 major military operations, India has historically taken a lackadaisical approach to national security issues. Since it was only unified in 1947, it has no long tradition of strategic thought as a nation. Only recently has India become conscious of the need for strategic defense. The funding of defense expenditures was also not considered a core priority and was handled ad hoc. At the same time, there was also a great deal of bureaucratic inflexibility in the Armed Forces structure, and no tradition of true cross-service considerations. It was only in 1995 that India was able to state a comprehensive defense policy, even though a partial one.<sup>7</sup> There is current debate within India as to the best way to resolve these structural issues.

### *Military Requirements*

Indian defense analysts have discussed at length the missions that the Indian Armed Forces (IAF) should be prepared to execute in the beginning decades of the 21st century.<sup>8</sup> In general, India's military must be prepared to conduct large-scale regional wars, with the potential for both conventional attack and operational and tactical nuclear use on land and at sea. As a result, the IAF must be prepared to conduct both defensive and offensive operations in conditions presented by the enemy's battlefield use of weapons of mass destruction. India must also be prepared to defend against land- air- and sea-based missile attack. The Indian Navy must execute both sea denial and sea control missions against Chinese and Pakistani incursions. Indian nuclear forces must be ready to conduct timely counter strikes against enemy targets, as well as employ such weapons in single or numerically limited demonstrative strikes against battlefield targets or targets deep within enemy territory.

There is also increasing dialog within the military literature that suggests that current security concerns coupled with the dynamics of the issues derived from the global revolution in military affairs (RMA) may require mission emphasis adjustments among the services. The dialog has led to calls for a greater reliance on long-range air power to deter the hostile acts of aggressor countries towards India. More emphasis is being given to the role of the navy to protect India's critical sea lanes in the Persian Gulf approaches as well as in the Indian Ocean. This has resulted in calls for a shifting of the balance of conventional military power towards the Navy and Air Force.<sup>9</sup>

To meet these challenges, India has formulated a new war-fighting doctrine. In this doctrine, the Armed Forces must prepare for a cyber-based war in the 21<sup>st</sup> century that will require substantial military modernization to prosecute. The reorientation of India's fighting doctrine is based on awareness that its offensive forces must not be used in a way that could make them an escalator for nuclear war.<sup>10</sup> Huge tank and artillery armies are therefore obsolete and the emphasis will be on smaller highly mobile battle groups designed to destroy adversary combat capabilities rather than occupy territory. Thus, hyper war will aim to neutralize enemy offensive forces using smart munitions well before they come into visual range.<sup>11</sup>

#### *Armament Requirements*

An immediate concern of India's armament strategy is to solve the problem of pending block obsolescence of major weapons systems. During the next 10-15 years, India will need to replace all of its major systems. The Air Force is reported to need 400 fighters, 100 transport aircraft, 140 helicopters, and a replacement of a large number of its surface-to-air missiles. The Navy will require nearly 55 ships, including at least seven submarines and two aircraft carriers, to maintain current force levels. The Army will need 1500 main battle tanks, 500 infantry combat vehicles, and 500 pieces of self-propelled artillery.<sup>12</sup>

In addition to the replacement of aging systems, India also has requirements for significant new capabilities. NATO's high technology air operation in Yugoslavia, combined with the recently concluded high-altitude conflict in the Kargil region of Kashmir, appears to be blessings in disguise to the Indian armament industry. Modernization programs that have been on the shelf are being dusted off and reexamined. The accelerated acquisition of new, high technology weapons systems is being studied, especially in light of an apparent plan to lift the defense budget ceiling. As a result of Kargil, for example, plans to accelerate the induction of the indigenous Advanced Jet Trainer (AJT) are being argued—apparently with renewed success—by the Indian Air Force.<sup>13</sup> The conflict has also given new urgency to armaments modernization, especially for UAVs, weapon-locating radar systems, and modern communications systems.<sup>14</sup> The Ministry of Defense has stated that the Kargil war also surfaced significant shortcomings in basic infantry weapons and ground surveillance capabilities.<sup>15</sup>

India is giving special priority to naval developments. Ninety seven percent of India's trade is sea-borne and the bulk of India's oil supplies is imported. Indian naval

developments are focused on the eventual creation of a three aircraft carrier force, which will allow two to be at sea at all times. India also has decided to build a large aircraft carrier instead of the smaller air defense ship originally envisioned. The ship, to be called the INS Vikrant, will be built indigenously, but will operate Russian aircraft.<sup>16</sup> India believes that this will also contribute to the safety of the East-West sea lines of communications passing through the Indian Ocean.<sup>17</sup> Additionally, the Navy will help contain the threat from Pakistan as well as provide air defense systems effective against China.<sup>18</sup>

In order to strengthen its deterrence capabilities, India has announced a Minimum Nuclear Deterrence (MND) initiative designed to build a nuclear triad of land-based missiles, aircraft, and ship-launched missiles.<sup>19</sup> Some of India's purchases are designed to provide the platform capabilities needed to house and launch nuclear missiles. India has also announced a major new comprehensive development program designed to upgrade and field a broad range of new missiles. These will include an intercontinental range Surya missile system with a range in excess of 5000 km,<sup>20</sup> a new medium-range naval missile, and a medium-range air-to-air missile.<sup>21</sup>

#### *India's defense budget*

India's annual military expenditure in 1997 was \$11B (1997\$US), compared with \$7B (1997\$US) in 1991.<sup>22</sup> This placed India 13<sup>th</sup> globally.

Traditionally, the Indian defense budget has remained a small portion of India's national budget, which continues to have large outlays for social programs and infrastructure maintenance and development. From 1962-1987 India spent on the average only 3.1 percent of GDP on defense. In the early 1980's, her defense budget rose due to the increased cost of weaponry coupled with the need to offset growing Chinese and Pakistani military capabilities, rising to 3.6 percent in 1987. In the early 1990s, defense spending decreased, but it began to rise over the decade.<sup>23</sup>

Currently, the defense budget is only 2.3 percent of GDP, with increasing pressure to raise this number, due, primarily, to rising concern over China's future intentions and Pakistan's nascent nuclear and long range missile program. With inflation and rupee depreciation factored in, budgetary numbers become even slimmer. Currently, as little as five to ten percent of the defense budget is earmarked for modernization and weapon induction. The lion's share is expended on pay, allowances and maintenance of aging equipment. Defense analysts argue that the defense budget must be increased to three percent, at a bare minimum, to compensate for these factors.<sup>24</sup>

The Kargil incursion prompted immediate considerations to increase the defense budget. By early August 1999, an actual increase to 3 percent of GDP was being considered.<sup>25</sup> The proposed federal budget announced in February 2000, contained a 20 percent increase in the defense budget over the previous year.<sup>26</sup> A new dimension to the Indian defense budgeting process is the virtual unanimous agreement of Indian political parties that the Indian Armed Forces should be equipped with the latest armaments.<sup>27</sup>

## **II. National Defense Industrial Base**

India maintains an extensive defense industrial base principally owned by the government. At independence, industrialization was viewed to be the engine of growth and jobs for the rest of the economy, and since then the government has owned a large fraction of the industries and also tightly regulated the private sector. India believed that public ownership was necessary to insure developments that would benefit the entire country. India decided early that the defense industries would be owned by the public sector, and the Indian penchant to establish a “socialist pattern of society” still dominates the defense industrial base.

India’s defense industrial capacity lies in three main classes of enterprises: the Ordnance Factories (OF), the Defense Public Sector Undertakings (DPSU), and, to a much lesser extent, selected civilian public and private sector manufacturing establishments. The OFs, founded in 1801, are departmentally run government units. There are 39 OFs, grouped into five areas based on the type of armaments they produce: Ammunition and Explosives, Weapons, Vehicles and Equipment, Armoured Vehicles, and Ordnance Equipment. There are eight publicly-owned DPSUs: Hindustan Aeronautics Limited; Bharat Electronics; Bharat Earth Movers; Mazagon Dock Ltd; Garden Reach Shipbuilders and Engineers Ltd; Goa Shipyard Ltd; Bharat Dynamics Ltd; and Mishra Dhatu Nigam Ltd. Both the OFs and the DPSU’s are trying to move toward greater self-reliance. The government is also trying to promote greater civil sector participation in the armament process.<sup>28</sup>

The bulk of OF production constitutes large quantities of low-medium technology armaments, including small arms, anti-tank and anti-aircraft guns, mortars, rockets, and ammunition. Commercial products include sporting arms and ammunition, automobiles, chemicals, power generators, and clothing.<sup>29</sup> The largest and most capable DPSU, Hindustan Aeronautics Limited, was created in 1964 and focuses on the design, manufacture, repair, and overhaul of aircraft, helicopters and related sub-systems. Bharat Electronics Limited is the major electronics manufacturer in India. Mazagon Dock Limited, taken over by the government in 1960, is the principal builder of warships, submarines, and offshore platforms. Bharat Dynamics, created in 1970, focuses on advanced guided missiles. Mishra Dhanu Nigam Limited concentrates on advanced materials development for a broad range of military and commercial applications.<sup>30</sup>

Although there has been an effort in recent years to expand civilian participation in defense production, there is a general consensus in the Indian defense establishment that “no clear government policy” exists which formalizes an “alliance and strategic partnership” between the armed forces and private industry.”<sup>31</sup>

India’s research and development activities are coordinated by the Defense Research and Development Organization (DRDO), established in 1958. The DRDO employs about 30,000 people, and operates through a network of 50 laboratories, 70 academic institutions, 50 national science and technology centers, and about 150 state-owned and

private industrial units.<sup>32</sup> The DRDO mission is to pursue self-reliance in critical military-relevant technologies.<sup>33</sup>

Overall responsibility for armaments development and production lies with the Department of Defense Production and Supplies in the Ministry of Defense, created in 1982 with a primary objective of developing an integrated defense industrial base for production of armaments with a view toward achieving self-sufficiency.<sup>34</sup>

### *Indian Global Top 100 Defense Industries*

In 1991 India had no companies in the Top 100 Global Defense Industries. By 1999 India had three with a combined revenue of about \$1.3B (1999\$US).<sup>35</sup> Those three companies are Hindustan Aeronautics Limited, Bharat Electronics, and Mazagon Dock Ltd. Annual defense revenues for the largest Indian defense company in 1999 are \$625M. The largest Indian company (in terms of annual defense revenue) ranked 48th<sup>th</sup> globally in 1999.

### **III. National Armament Strategy**

In spite of the fact that India has a large, established, and diverse defense industry, she also imports major systems in greater volume than any other developing or industrialized country. India has not yet been able to create the capabilities that would allow her to shift to indigenous development. India's goal is not self-sufficiency in the traditional autarkic sense, which is viewed to be unattainable, but self-reliance. To Indian leaders, the most important aspects of self-reliance are the ability of India to field weapons manufactured locally, and to provide for security of supply of spare parts and components.<sup>36</sup>

Indian armament strategy is based on an official policy of increasing indigenization. However this policy is overshadowed by the need for continued imports of foreign weapons systems and manufacture of foreign weapons systems under license in India itself. The indigenization program falls under the auspices of the DRDO, which is directly answerable to the Minister of Defense.

A special requirement placed on India's armament strategy is the need to acquire systems that can meet the harsh and diverse climactic conditions of the Indian subcontinent. Foreign systems developed for other situations are especially vulnerable to these conditions. To date, satisfactory armaments have resulted from imports that have been subjected to special tests, licensed production, and indigenous designs that were created in close conjunction with foreign partners, using imported components and material as needed.<sup>37</sup>

### *Towards self reliance*

Historically, India has tried to achieve self-reliance by a combination of diversification of sources of supply, licensed manufacture of armaments, and indigenous design, development, and production. However the decade of wars starting with the Sino-Indian

conflict of 1962 caused India to forgo extensive indigenous developments in favor of rapidly acquiring Soviet equipment on long-term credits at low interest rates. At that point, licensed manufacture of Soviet systems became the primary vehicle for self-reliance.<sup>38</sup> At the same time, the Indian armaments industry has no tradition of reverse engineering to establish local production of many of the foreign weapons systems in its inventory.

In 1994 India developed a ten-year plan to self-reliance. The plan focused on high-technology armaments and is intended to make India significantly independent of foreign technology in critical areas by 2005. The initiative focuses on three areas: self-reliance in spare parts of specific weaponry; life-extension of existing weaponry by developing critical subsystems domestically; and increasing the indigenous development and production of high technology armaments (although complete self reliance may not be possible). Areas targeted for greater indigenization include missile components, early warning systems, radar, metals, robotics, fiber optics, lasers, UAVs, and stealth technology.<sup>39</sup> India currently spends about 70 percent of its armaments budget on imports, and the goal is reduce that to 30 percent by 2005.<sup>40</sup> However progress towards goals of the Self-Reliance Initiative has been spotty. Attempts have been criticized in a number of recent government reports that argued that the OFs and DPSUs were not sufficiently focused and that planning was not being done with a sufficiently long-term perspective.<sup>41</sup>

The push to self-reliance in defense technologies is a serious undertaking and a daunting challenge to India's defense industries. Adbul Kalam, chief of the DRDO, argues that it will take 10 years to achieve an "acceptable" degree of self-reliance in defense supplies. By 2006, he expects this number to rise from the current 30 percent to 70 percent indigenous manufacture. Indian experts argue that the country is now completely self-reliant in science and technology.<sup>42</sup>

There is also debate within India on future product directions. Some argue that she should strive to develop the eventual capability to fully design, develop, and produce completed major armament systems. Others argue that India's considerable scientific and technical talent should be focused more efficiently on component design in conjunction with foreign partners to produce armament systems focused on competitive niche areas. In the latter case, India would continue to depend on an import strategy for acquiring sophisticated armaments.<sup>43</sup>

In addition to foreign dependencies, there are also internal difficulties inhibiting India's quest to self-reliance. For example, India's defense establishment does not have a wide range of off-the-shelf subsystems and component designs that can be incorporated into new systems, and also does not yet have an established network of subcontractors. There is also a problem that stems from the way in which India's requirements are set. India does not have a robust technological development program that identifies future technologies that will be available for incorporation into armaments. Rather India surveys foreign developments, and then picks the best technologies. This leads to design specifications that are either cost-ineffective or not possible to develop. This creates even

further delays reconciling the actual designs to reflect the realities of costs and developmental capabilities.<sup>44</sup>

India's three biggest recent systems projects—the Prithvi missile, the Arjun Main Battle Tank, and the Light Combat Aircraft (LCA)—have not been able to achieve the intended goals of self reliance in their development. The Prithvi missile has about 15-20 percent of foreign components and materials, and will be difficult to modernize its basic design without including foreign-developed sub-systems. About half of the Arjun's components are German, and 70 percent of the LCA's components are imported.<sup>45</sup>

The successful deployment of an indigenously-built large weapon system would add significant momentum to the domestic development of the most expensive major weapons systems, which now must be bought overseas (naval surface ships being the exception). India clearly has a long way to go in the achievement of self-reliance in major land and air combat platforms. Indicators of this include the technical setbacks in the ARJUN main battle tank program, delaying its deployment in desired numbers and forcing the purchase of 300 new Russian T-90 tanks instead. There are similar problems with the LCA. Problems are being solved, but the pace, combined with fiscal restraints, increase the frustration of the Indian Armed Forces.

#### *The armament process*

One of India's biggest problems is her armament process itself. Weapons planning is implemented with a 10–15 year lead time under the auspices of the Directorate of Perspective Planning of the Ministry of Defense. However, in recent years the gap between weapons planning and procurement or upgrading has been rising steadily, as defense allocations have not kept pace with inflation and a devaluing national currency.<sup>46</sup>

India has yet to demonstrate, even to itself, the ability to produce an acceptable heavy weapon system (with naval surface warfare construction generally being the exception). Current systems under development, including the Arjun main battle tank, the Light Combat Aircraft (LCA) and the Navy's super-secret nuclear-powered submarine have undergone technical setbacks and programming delays, to the chagrin of both military and governmental leaders, forcing continued heavy reliance on foreign systems. The Arjun and the LCA also have serious design and subsystems problems that have prevented them from entering series production.<sup>47</sup> Although the Indigenous Guided Missile Development Program is one of the more successful programs of Indian defense industry, even in this area missile development is also 7-10 years behind schedule.<sup>48</sup>

There are calls within India for more integrated and comprehensive approaches to defense planning. A 1996 study by India's Finance Commission criticized the services for concentrating on capital intensive systems (e.g., aircraft, ships) at the expense of sensors, command and control, logistics support, and missile systems. The services were also criticized for inadequate consideration of the long-term tradeoffs between upgrading existing platforms vs. longer-term needs for new ones.<sup>49</sup>



### *New urgency*

The urgency of Kargil has forced India to rapidly acquire needed urgently needed capabilities from external sources, since India's defense industrial base lags in the development and production of smart weapons and modern air defense systems, submarines, and self-propelled artillery. At the moment, the government has no option but to turn to externally.<sup>50</sup> Unless the United States opens up its domestic market to India to a greater degree, these will probably be acquired from Russian (70 percent) and European suppliers.<sup>51</sup>

The Army favors the immediate purchase of about 315 T-90 tanks from Russia instead of the production of the Arjun in order to offset Pakistan T-80 purchases from Ukraine. India has also approached Poland, Slovakia, and Ukraine to jointly develop new engines to upgrade her T-72 tanks. India does not have the funds to simultaneously purchase T-90's, build Arjun, and upgrade the T-72s, so some difficult choices will have to be made.<sup>52</sup> The Russian agreement calls for purchase of an initial lot made in Russia, followed by subsequent licensed production of the remainder in India. Nevertheless, the Indian Defence Ministry has also stated that the eventual intent is for the Arjun to be the Indian mainstay, and the purchase of the T-90 will allow Arjun developments to benefit from the Russian technology and expertise.<sup>53</sup> In July 2000, low-rate production of the Arjun was finally initiated after 26 years of development, with an intended production run of 124 tanks by 2004.<sup>54</sup>

### *Arms imports*

Since 1962, India had depended on the Soviet Union to provide weaponry, either via direct acquisition, or preferably via licensed manufacturing. Although India has embarked on new program of self-reliance, continued access to designs suitable for licensed production are essential to achievement of her goals for self-reliance. In the decade of the 1990's, significant changes in India's strategic situation have accelerated the requirement for cooperation with foreign countries as a means of procuring and modernizing India's armaments. At the same time, there is concern that this strategy should not adversely affect India's indigenous defense industrial base.<sup>55</sup>

At least in the short term, India's relative technological capabilities compared to Pakistan and China are heavily dependent on her import successes, and much less so on her indigenous armament capabilities. One Indian analyst argued that India's local conventional advantage over China depends on receiving Russian systems before China does.<sup>56</sup> Faced with US-delivered F-16's to Pakistan, India's realistic choices were to continue to depend on the Indian Air Force capabilities—a mix of British, French, and Russian aircraft—or to procure new offsetting aircraft. The main choices were the French Mirage 2000, which has lesser range than the F-16, or the Russian Su-27/30, which is the choice India has pursued.<sup>57</sup>

### *The Russian connection*

India has made a strategic decision to upgrade its armaments by purchases, licensed production, and leasing from Russia. Part of the logic was the India's prior experience with Soviet-made equipment. Another consideration was the fact that the sanctions imposed by the West on India after her recent nuclear tests made other suppliers less available.<sup>58</sup> A major cooperation protocol agreement was signed in November 1999. The agreement included procurement of six S-300V air defense systems, two Amur class submarines, three Khrivak class frigates, Club class anti-ship cruise missiles and air defense missiles, and T-90 tanks. Also agreed to were the lease of six Tu-22M3 Backfire aircraft and two A-50 early warning aircraft, licensed production in India of 40 SU-30MKI multi-role fighters, and transfer of the Admiral Gorshkov aircraft carrier to India.<sup>59</sup>

India will also acquire Russian Novator Alfa Klub SS-N-27 underwater anti-ship cruise missiles for use on its new submarine and also on the older Kilo subs.<sup>60</sup> Russian aircraft (Mig 29 fighters and Ka-31 early warning helicopters) will also be used on the new Indian Aircraft Carrier. Additionally, the Admiral Gorshkov will be refitted with two squadrons of the MiG-29 MKI.<sup>61</sup> Russia will transfer the Gorshkov free of charge, and India will pay for overhaul and for the MiG 29.<sup>62</sup> India will also purchase 100 T-90C Main Battle tanks, and will acquire the production license for the manufacture of an additional 200 in India, which will actually involve final local assembly from dismantled kits to be provided by Russia.<sup>63</sup>

India also is negotiating with Russia for licensed production of the Su-30 MKI multi-purpose aircraft, for modernization of India's MiG-21 and MiG-29 fighters, for special training for pilots and technical personnel, and for a general maintenance agreement for India's Soviet-era fighters.<sup>64</sup> India and Russia have also signed a ten-year protocol for joint production in India of a wide range of military and civilian aircraft.<sup>65</sup> India has plans to purchase a full suite of Russian missiles. These include: 400-500 upgraded AA-8 Aphids for combat aircraft; at least 300 AA-20 Atolls for the Mig-27s; at least 200 AA-10 Alamos for its Mig-29s; at least 200 S-125 Neva ground air defense missiles; 400 SA-6 surface-to-air missiles; 200 SA-8 surface to surface missiles; 20 SA-9 low altitude surface-to-air missiles; and 500-1000 Uran naval tactical missiles.<sup>66</sup> Other purchases from Russia include K-31 helicopters<sup>67</sup> and the Smerch multi-barrel rocket system.<sup>68</sup>

Although India clearly recognize the financial and operational advantages of continuing with their legacy Soviet/Russian armaments, recently some have argued that perhaps it would be a better to diversify India's sources of supply to take advantage of what is now available on the world market.<sup>69</sup> One concern has also been expressed about the possibility of Russian and Indian interests diverging as Russian attempts to achieve greater integration with Western European defense industries.<sup>70</sup>

### *Other suppliers*

In addition to Russia, France is becoming a growing supplier to India. India is negotiating with the French company DCN to provide technical assistance and subsystems for two modern German submarines that will be built in India.<sup>71</sup> India will also purchase Mirage 2000, Alpha Jet Trainers, and Turbomeca engines for the Advanced Light Helicopter.<sup>72</sup> Since Dassault no longer makes the Alpha Jet in France, she has offered to transfer the entire assembly line to Hindustan Aeronautics Limited for licensed production.<sup>73</sup> India also plans to purchase top of the line Dassault-produced Rafale combat aircraft (in preference over Russian Sukhoi aircraft).<sup>74</sup> India is also seeking French assistance to help reopen its submarine production line.<sup>75</sup> Recently, as a part of a major new missile acquisition initiative, Russia announced intentions to purchase at least 250 R550 Magic air-to-air missiles from Aerospatiale Matra.<sup>76</sup>

Weaponry from other countries is also being sought. India is in the process of competitively assessing howitzers build by Singapore (Chartered Industries), Finland (Vamas), the UK (Vickers), South Africa (Denel), Sweden (Celsius), France (Giat), Singapore (ODE), Spain (Santa Barbara), and Slovakia (Zavody Taskeho Strojarsstva). However recently India has delayed purchase of the howitzers because of the more urgent need to buy Russian T-90 tanks.<sup>77</sup> India also has growing defense ties with Israel. These include the purchase of UAVs<sup>78</sup> and negotiations to purchase seven Barak ship-borne antimissile systems.<sup>79</sup> India has also has finalized a bilateral agreement with South Africa for co-development and production of armored vehicles,<sup>80</sup> an agreement that will probably include technology transfers and joint business and marketing.<sup>81</sup> British Aerospace has also contracted to provide Hawk advanced jet trainers to India.<sup>82</sup> Currently, India is also evaluating Russian, German, American, and Ukrainian bids for counter-battery radars.<sup>83</sup>

India also has decided to expedite the acquisition of a new SSK-class submarine. The Navy is eight submarines short of what it needs, and the plans are to produce the new submarine indigenously, based on foreign designs. Germany (HDW) and France (Thompson-CSF/DCN International team) are on the short list to provide the basic design.<sup>84</sup>

Because of funding limits, India currently is planning on delaying the phasing out of 200 older combat aircraft until there are sufficient funds to complete the acquisition of about 60 new Su-30 aircraft from Russia and about 40 Mirage 2000 aircraft from France. India has a fleet of about 700 combat aircraft, and significant upgrades will also have to be completed to keep that level operational, which also depend on adequate funding. About 300 aircraft will have to be upgraded in the next ten years. Some will be done indigenously, but upgrades of the India's Mig-29 fleet will be done jointly with Russia's Aircraft Building Corporation (formerly VPK-MAPO), using avionics provided by Sextant Avionique (France).<sup>85</sup> Kits for the Mig-21 upgrades will be provided by Russia's Sokol plant.<sup>86</sup>

### *Offset policy*

India has no mandatory offset requirement. At the same time, the government frequently tries to obtain offsets for large projects. India's offset standards of 10-50% are significantly below the world wide average.<sup>87</sup>

### *Arms import level*

In 1997, India's import level was only \$0.4B (1997\$US), compared with \$1.1B (1997\$US) in 1991.<sup>88</sup> This placed India 26<sup>th</sup> globally. The planned imports as a result of the Kargil initiatives will increase that level substantially.

## **IV. Perspectives on the International Arms Export Market**

Traditionally, India has deliberately minimized arms exports. However recently, in light of new global defense industrial realities, the first steps have been taken to reverse this policy.

In 1999 India hosted its first international land and naval systems exhibition, DEFEXPO INDIA'99. All of the OFs and DPSUs and several private sector companies displayed products.<sup>89</sup> About 80 Indian companies participated. Attendees included representatives from 30 countries and 117 foreign companies. According to Defence Minister George Fernandes, the objective of this exposition was to interest foreign partners in international collaboration and joint ventures, technology transfers, and co-production facilities to develop and produce arms exports for sale to third countries. India's strengths include the high skill level and relatively low costs of its technical workforce.<sup>90</sup> Fernandes also said that India was considering exporting certain kinds of missiles and armor systems to friendly countries.<sup>91</sup>

Subsequently, Indian defense industry has mounted a major initiative to achieve defense export growth, an objective that seems realistic because of the current low levels of export. For example, the Ordnance Factories collectively, and the two largest DPSUs, Hindustan Aeronautics Limited and Bharat Electronics Ltd, each only currently export about \$10M annually. Current Indian exports are limited to a few isolated areas, including MiG-21 spare parts to Egypt and Vietnam, communications equipment to African companies, brake parachutes for MiG fighters to Algeria, and small arms to Thailand and Cyprus. Indian objectives include the export of corvette and missile boats, spare parts for Soviet/Russian aircraft, communications equipment, and small arms and ammunition. The OFs have begun to export ammunition and other items.<sup>92</sup> Also, India's Guided Missile Development Program, underway since the 1980's, has been generally successful, and South Africa has shown interest in acquiring the Nag Anti-Tank Guided Weapon for mounting on its Rooivalk attack helicopters.<sup>93</sup> In 1999 six Indian companies marketed their products at the LIMA '99 exhibition in Malaysia. Indian companies have no illusions about the difficulty of increasing their export market share under current global market conditions.<sup>94</sup>

One area of interest for future international defense work is the upgrade market. Indian experts point to the lucrative Israeli experience of upgrading foreign weapons systems, especially those of Russian manufacture. Moreover, they argue that the Israeli experience demonstrates that a “modernized system is as efficient as any new system and many times cheaper.” There are calls to focus India’s defense industrial capabilities on this area to help other countries in the region improve their defense capabilities, as well as to earn hard currency for India.<sup>95</sup> This initiative is backed by all of the Service Chiefs, the Ordnance Factory Board and the DPSUs.

There are also new calls within India to remove restrictions on exports in order to be able to generate new income to support the modernization of India’s Armed Forces. In 1999 the Parliament’s standing committee on defense asked the government to provide a special waiver on license restrictions in order to boost international sales, to provide embassy help in promoting defense exports, and to restructure the Ordnance Factories to include special export divisions. Targeted regions include south and south east Asia, the Middle East, and Africa. The Indian private sector also has expertise that could be accessed to help grow defense exports.<sup>96</sup>

There are precedents in the Indian space program that also indicate shifts in government views of high technology industry and export requirements. The Indian government has recently agreed to transfer rocket building and satellite launch activities from the state-owned Indian Space Research Organization (ISRO). This will allow ISRO to concentrate on high-tech research and development and systems engineering, while at the same time facilitating the ability of private industry to operate in foreign markets.<sup>97</sup>

#### *Arms export level*

In 1997, India’s arms export level was only \$90M (1997\$US), compared with an even smaller \$6M (1997\$US) in 1991. This placed India 19<sup>th</sup> globally.

### **V. Transformations in the Defense Industrial Base**

There is a strong rationale for major changes in the Indian defense industrial base, and there are calls to rethink the strategy for India’s aerospace industry in order to remain competitive in the face of global trends in mergers, acquisitions, and globalization.

The Indian aerospace industry has progressively declined. Hindustan Aeronautics Limited (HAL), India’s premier aerospace company, today has a massive infrastructure, poor productivity and efficiency, high overhead costs, much obsolete production technology, no experience with competition, and significant idle capacity due to declining Indian Air Force orders. At the same time, HAL has a talented and motivated workforce. Some are encouraging restructuring and partial divestiture, placing HAL under professional corporate management, encouraging HAL to compete in the international market place, and diversification into both the civilian and export markets.<sup>98</sup>

Publicly held companies, facing growing under-utilization, rely heavily on government subsidization. For example, the utilization of the Ordnance Factories dropped from 100 percent to 68 percent of capacity from 1988 to 1994. In another example, in late 1996 it was reported that the Avadhi tank factory, which manufactured T-72 tanks under license, had an annual capacity of 100 vehicles but production had not exceeded 75 units. Added production costs caused by supporting ancillary industries and inflation often resulted in vehicles costing more than those bought directly from Russia.<sup>99</sup>

The Ordnance Factories also have obsolescent equipment and are developing low-end technology products. The Parliamentary Committee on Defence has directed that the underutilized capacity be leased to the private sector, that the labor force be reduced, and that the OFs not duplicate technology development available in the civilian sector.<sup>100</sup> Recently the government has taken steps to modernize the OFs, pledging \$1B for investment over the next five to seven years. About 40 percent of the equipment needs replacement, but personnel issues also will be key. There is no current intent to downsize the workforce, but some are arguing that without major changes in the administrative structure, and fewer staff, the OFs will not be able to meet India's requirements and continued imports will be required.<sup>101</sup>

India's Defense Research and Development Organization (DRDO) is also having problems with modernization.<sup>102</sup> Some argue for greater DRDO efficiency, privatization, and technological upgrades if India is to reach its goal of self-reliance. The DRDO is currently plagued by cost overruns, insufficient government funding, obsolete production equipment, and inadequate planning. The major projects (Arjun, LCA) are far from completion even though there have been others that have been successful. The Parliamentary Standing Committee on Defence has criticized the DRDO for over-extension. The DRDO is also losing about 3 percent of its technical workforce per year. The services are highly critical of the DRDO, arguing that it is too inefficient and not capable of relevant production; the DRDO in turn criticizes the services for ad hoc and inconsistent planning and budgeting.<sup>103</sup> Efforts to restructure the DRDO have been underway since the early 1990's, when several hundred projects were terminated because of either lack of progress, non-viability, or technological obsolescence. However the DRDO still lacks strategic focus, except in a few isolated areas.<sup>104</sup>

In the 1990's, India has attempted to diversify the efforts of both the OFs and the DPSUs to commercial markets. The objective is to reduce costs, provide currently unused capacities to the civilian sector, and increase the exposure of the defense public sector establishments to commercial practices in order to increase management sensitivity to costs and prices. In 1995-1996 about half of the value of the production of these establishments was done for the commercial sector.<sup>105</sup>

### *The pace of change*

In a country famous for its labyrinth-like and ponderous bureaucracy, change comes slowly to the Indian defense industrial base. Low utilization rates of factories and production lines continue. Strong traditional socialistic leanings of government and

society mandate steering away from tough solutions of privatization, lay-offs and facility reductions.

A radical shift in India's defense industry will probably only take place after a national reassessment of India's regional and global role. Traditional Gandhian pacifist tendencies now hobble India's desire to be taken seriously by first world powers. This tendency restricts the expansion of Indian influence throughout the region and minimizes any leverage it hopes to wield with the United States and others. Bureaucratic inertia seems to have discouraged all but the most determined and powerful of the defense intellectual elite. In the face of global dynamism in the armaments industry, there has not been a sense of equivalent urgency in India, stemming from the long-standing view that public ownership safeguards national strategic interests. It appears that any change in the Indian defense industry will have to be implemented gradually over time; however increasing anxiety over Pakistan's intent and China's ambitions seem to have boosted the process.<sup>106</sup>

### *Privatization*

One of the sources of potential transformation is rooted in India's historic ownership of the industrial base. In addition to the defense industries, in the mid-1990's India had state-owned monopolies for energy and communications production and services, and also dominated the steel, nonferrous metal, machine tool, shipbuilding, chemical, fertilizer, paper, and coal industries. State protectionism has contributed to weakness of Indian industry. Foreign competition was largely kept out of the domestic market, exports were not prime consideration in the plans of Indian industry and industry had general weak management. Additionally, such issues as product quality, economies of scale, and outside technological developments received insufficient attention. India is currently confronted with industry-wide transformations to try and rectify some of these problems.

The decision to privatize India's defense sector has been debated since the early 1990's. Currently, private sector participation consumes only about seven percent of armament expenditures.<sup>107</sup> Even though the issue still continues to be discussed and debated, there is no major movement at the moment toward privatization of the defense industrial base. Although the military favors privatization, the government is concerned about loss of jobs and the subsequent political consequences. At the same time, the DRDO in 1998 opened up seven of its laboratories involved in dual-use technology and software development to the private sector. Defense Minister Fernandes argues that privatization would not only upgrade obsolete machinery in DRDO establishments, but also push up exports.<sup>108</sup>

### *Greater private sector involvement*

A government committee headed by the Vice Chief of the Army Staff LTG Chandra Shekhar recently concluded that India is far from achieving its self reliance goals, and advocated basic changes in government policy and in the defense industrial base. These included: increased participation by private industry, with a view to increasing export

market share, overhauling the existing OF/DPSU operations to make them more flexible, and improved procurement procedures. A better long-term perspective, and private industry involvement, was viewed to be essential to the reform of the defense industrial base.

In 1998, Indian Defense Minister George Fernandes invited the Confederation of Indian Industries to suggest ways to revamp the DPSUs and privatize them in 45 days. Six committees were formed to establish six task forces to identify specific partnerships areas with at least seven DRDO laboratories involved in developing dual-use technologies, bio technologies and software products, but no progress has been made to date. Additionally, the government has still not amended the 43-year-old Industrial Policy Resolution that governs the defense industry and currently forbids outside participation.<sup>109</sup> There are three hundred private companies interested in defense production, but the companies want changes in industrial policy regulations. The companies also seek greater predictability in defense funding to offset the large entry costs.<sup>110</sup>

However, some influential figures argue that the huge investments required by the private sector, combined with the unsteady demand for armaments is economically unsound, or unless India wishes to export weapons to help support the defense industry (a policy which is not popular among Indians, as noted above).<sup>111</sup> Thus, a gradualist approach to the privatization of part of the defense industrial base is argued, with only incremental strides anticipated towards this goal.

## **VI. Risks and Concerns**

- An immediate concern of India's armament strategy is to solve the problem of pending block obsolescence of major weapons systems. During the next 10-15 years, India will need to replace all of its major systems. Unless the United States opens up its domestic market to India to a greater degree, these will probably be acquired from Russian (70 percent) and European suppliers.
- Although India's clearly recognize the financial and operational advantages of continuing with their legacy Soviet/Russian armaments, recently some have argued that perhaps it would be a better to diversify India's sources of supply to take advantage of what is now available on the world market. One concern has also been expressed about the possibility of Russian and Indian interests diverging as Russian attempts to achieve greater integration with Western European defense industries.
- Traditional pacifist tendencies continue to block arms exports and act as a barrier to the shoring up and expanding the Indian defense industrial base, even to meet the nation's steadily expanding requirements.

## **VII. Some Observations**

- India's goal is not self-sufficiency in the traditional autarkical sense, which is viewed to be unattainable, but self-reliance. To Indian leaders, the most important aspects of



self-reliance are the ability of India to field weapons manufactured locally, and to provide for security of supply of spare parts and components.

- India is debating the direction of her future defense products. Some argue that she should develop the eventual capability to fully design, develop, and produce completed major armament systems. Others argue that India's considerable scientific and technical talent should be focused more efficiently on component design in conjunction with foreign partners to produce armament systems focused on competitive niche areas.
- Under the national self-reliance program, India 2020, strategic objectives have been set to reach high levels, if not complete self-reliance in national production, including defense production over the next 20 years.
- Historically, India has tried to achieve self-reliance by a combination of diversification of sources of supply, licensed manufacture of armaments, and indigenous design, development, and production. However the decade of wars starting with the Sino-Indian conflict of 1962 caused India to forgo extensive indigenous developments in favor of rapidly acquiring Soviet equipment on long-term credits at low interest rates. At that point, licensed manufacture of Soviet systems became the primary vehicle for self-reliance.
- The Indian armaments industry has no tradition of reverse engineering to establish local production of many of the foreign weapons systems in its inventory.
- The conflict in Kargil has also given new urgency to armaments modernization, especially for UAVs, weapon-locating radar systems, and modern communications systems. At the same time, the urgency of Kargil, in spite of India's Self-Reliance Initiative, has also forced India to rapidly acquire urgently needed capabilities from external sources. This is because India's defense industrial base lags in the development and production of smart weapons and modern air defense systems, submarines, and self-propelled artillery. At the moment, the government has no option but to turn to external suppliers.
- India has made a strategic decision to rapidly upgrade its armaments by purchases, licensed production, and leasing from Russia. Part of the logic was the India's prior experience with Soviet-made equipment. Another consideration was the fact that the sanctions imposed by the West on India after her recent nuclear tests made other suppliers less available.

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